

A ROUTER IMPLEMENTED  
WITH A GAMMA GRAPH INTERCONNECTION NETWORK

ABSTRACT OF THE DISCLOSURE

A router coupled to a plurality of external links transporting data packets to and  
5 from the router. Embodiments of the router including a plurality of fabric routers  
interconnected by fabric links forming or capable of forming a Gamma graph  
interconnection network. One or more external links are coupled to each fabric router  
allowing the routing of packets between external links by traversing one or more hops  
across the fabric links. The Gamma graph interconnection network of the router  
10 providing for high port counts and increased bandwidth availability. Furthermore, the  
use of industry standard buses, such as Infiniband buses, allow for the interconnection  
of multiple heterogeneous application specific modules to interface and communicate  
with one another.

head flit is forwarded only when the credit count equals three. Non head flits are forwarded whenever the credit count is non-zero. If a flit is waiting for the availability of a downstream buffer, receipt of a CN will trigger the creation of a FIR. If no flits are waiting, the receipt of a CN causes the Credits counter to be incremented.

5           A particular virtual segment can be in one of three states:

ChState=00 — the segment is idle, the tail flit of the last scheduled packet has been forwarded and no packets are waiting in any of the input buffers.

10           ChState=01 — a waiting packet has been sourced from one of the input ports and the OutputController is waiting for the tail flit of the previously transmitted packet to be removed from the downstream InBuf memory.

ChState=1x — the head of the packet has been forwarded and the EgressController is waiting for bodies and the tail of the packet to forward.

15           While this invention has been particularly shown and described with references to preferred embodiments thereof, it will be understood by those skilled in the art that various changes in form and details may be made therein without departing from the scope of the invention encompassed by the appended claims.